

Mark Scheme (Results)

November 2008

GCSE

360Science

GCSE Additional Science B2 (5016H/1H)

GCSE Biology B2 (5028H/1H)

Using the Mark Scheme

1. This mark scheme gives you;
 - * an idea of the type of response expected
 - * how individual marks are to be awarded
 - * the total mark for each question
 - * examples of responses that should not receive credit.
2. ; separates points for the award of each mark.
3. / means that the responses are **alternatives** and either answer should receive full credit.
4. () means that a phrase/word is not essential for the award of the mark but helps the examiner to get the sense of the expected answer.
5. Phrases/words in **bold** indicate that the meaning of the phrase/word is **essential** to the answer.
6. **OWTTE** (or words to that effect) and eq (equivalent) indicate that valid alternative answers (which have not been specified) are acceptable.
7. '**Ignore**' means that this answer is not worth a mark but does not negate an additional correct response.
8. '**Reject**' means that the answer is wrong and negates any additional correct response for that specific mark.
9. **ORA** (or reverse argument) indicates that the complete reverse is also valid for the award of marks.
10. ecf (error carried forward) means that a wrong answer given in an earlier part of a question is used correctly in answer to a later part of the same question.

Marking

1. You must give a tick (in red) for every mark awarded. The tick must be placed on the script close to the answer. The total mark awarded for a question should be written in the box at the end of the question.
2. The total marks for a question should then transferred to the front of the script.
3. Suggestion/explanation questions should be marked correct even when the suggestion is contained within the explanation.
4. **Do not** award marks for repetition of the stem of the question.
5. Make sure that the answer makes sense. **Do not** give credit for correct words/phrases which are put together in a meaningless manner. Answers must be in the correct scientific context.

Amplification

1. In calculations, full credit must be given for a bold, correct answer. If a numerical answer is incorrect, look at the working and award marks according to the mark scheme.
2. Consequential marking should be used in calculations. This is where a candidate's working is correct but is based upon a previous error. When consequential marks have been awarded write "ecf" next to the ticks.
3. If candidates use the mole in calculations they must be awarded full marks for a correct answer even though the term may not be on the syllabus at their level.
4. If candidates use chemical formulae instead of chemical names, credit can only be given if the formulae are correct.

Question Number	Answer	Accept	Reject	Mark
1(a)	larger lungs / breathe deeper/ breathing rate increases/ more red blood cells / haemoglobin has greater affinity for oxygen / heart beats faster;	large lungs / breathe/take in more air/oxygen / more haemoglobin/ haemoglobin carries more oxygen/	references to fur	(1)

Question Number	Answer	Accept	Reject	Mark
1(b)	<p>Any one problem or adaptation, to get both marks the adaptation has to be linked.</p> <p>A cold ;</p> <ol style="list-style-type: none"> 1. more insulation /thicker fat layer / 2. thicker feathers / extra (down) feathers / 3. use wings more to produce (more) heat; <p>OR</p> <p>B buffeting/strong winds;</p> <ol style="list-style-type: none"> 1. strong flyers / strong feathers / 2. streamlined/ 3. flying in formation; <p>OR</p> <p>C longer time without feeding/resting;</p> <ol style="list-style-type: none"> 1. large food reserves/ higher proportion of fat in food reserves / 2. streamlined / 3 flying in formation; <p>OR</p> <p>D low pressure / air thinner;</p> <ol style="list-style-type: none"> 1. tolerate water collecting in tissues/ 2. bigger/longer/more curved wings; <p>OR</p> <p>E bright sun / higher levels of UV light;</p> <ol style="list-style-type: none"> 1. white feathers/ 2. eyes have feathers to shade them; 	<p>thick fat layer traps more air in feathers lots of feathers/thick feathers</p> <p>powerful wings/large wing span</p> <p>no food to eat feed more before flying</p> <p>gliding for longer</p>	<p>references to fur for the adaptation mark</p> <p>flying closer to sun.</p>	<p>(2)</p>

Question Number	Answer	Accept	Reject	Mark
2(a)	<p>Three from :</p> <ol style="list-style-type: none"> 1. to get more oxygen 2. to muscles / muscles working harder/faster 3. for more (aerobic) respiration ; 4. for more energy ; 5. to remove more carbon dioxide ; 6. to prevent cramp/build up of lactic acid/reduce oxygen debt 	<p>get more air into lungs/ oxygen into blood quicker / oxygen demand is high named muscle including heart</p>	<p>anaerobic respiration</p>	(3)

Question Number	Answer	Accept	Reject	Mark
2(b)	<p>idea of using a breathing rate monitor</p> <p>repeat several times (take average)</p>	<p>respirometer/ spirometer/ use a computer</p>	<p>heart/pulse rate monitor</p>	(1)

Question Number	Answer	Accept	Reject	Mark
3(a)	<p>selective breeding / artificial selection ;</p>		<p>natural selection</p>	(1)

Question Number	Answer	Accept	Reject	Mark
3(b)	<p>Two of:</p> <ol style="list-style-type: none"> 1. (milk) fat content/ less or more creamy/etc ; 2. (milk) mineral / calcium content ; 3. (milk) vitamin /vitamin D content ; 4. taste ; 5. volume/amount/quantity/ yield of milk; 6. characteristics of calf such as calm/healthy/ faster growth/fertility; 	<p>ref to nutrients can be credited for 1 mark if marking point 1,2,3 not given</p> <p>quantity/leaness of meat</p>		(2)

Question Number	Answer	Accept	Reject	Mark
4(a)	<p>correct plotting to an accuracy of half square;</p> <p>deduct 1 mark for incorrect point</p> <p>C grade line - smooth line showing trend of their plotted points;</p>	<p>dot to dot line</p>		<p>(2)</p> <p>(1)</p> <p>max (3)</p>

Question Number	Answer	Accept	Reject	Mark
4(b)	amino acid/protein / any named plant protein / chlorophyll / DNA / RNA ;			(1)

Question Number	Answer	Accept	Reject	Mark
4(c)	<ol style="list-style-type: none"> 1. use nitrate fertiliser quoting a number between 450 and 600; 2. density of 67 kg per hectare; 	Credit 400 kg of fertiliser if density is kept at 50 kg per hectare(1 mark)		(1) (1) max (2)

Question Number	Answer	Accept	Reject	Mark
5(a)	Three of: <ol style="list-style-type: none"> 1. increasing anyway (at this time of year) as light intensity / duration/ temperature increasing; 2. eutrophication; 3. extra nitrates/ ammonia (enter the water) ; 4. extra phosphates (enter the water); 5. used for protein/other correct plant substance; 6. sewage has killed the animals which eat the algae; 	Sewage acts as a fertiliser/provides nutrients/minerals as 1 mark for marking points 3 and 4		(3)

Question Number	Answer	Accept	Reject	Mark
5(b)	nitrates/ phosphates/ sewage / fertiliser/nutrientsflowed downriver/ out to sea/ sewage/nitrates/phosphates/ fertiliser became diluted /used up by algae / more algae eaten by (increased number) of herbivores ;			(1)

Question Number	Answer	Accept	Reject	Mark
6(a)	(magnesium is used to make) chlorophyll;	chloroplast		(1)

Question Number	Answer	Accept	Reject	Mark
6(b)	all active transport sites used/ temperature at optimum / ATP/energy being supplied at maximum rate / magnesium no longer a limiting factor;	cells/roots unable to increase rate of uptake of magnesium (ions)any more. other references to something else becoming a limiting factor		(1)

Question Number	Answer	Accept	Reject	Mark
6(c)	<p>Three from:</p> <ol style="list-style-type: none"> 1. (magnesium absorbed by) active transport ; 2. (active transport) uses energy ; 3. (poison) stops energy production ; 4. does not fall to zero because some Mg (ions) absorbed by diffusion ; 5. accept anaerobic respiration still supplies some energy ; 	idea of '(ion) pump'		(3)

Question Number	Answer	Accept	Reject	Mark
7(a)	<ol style="list-style-type: none"> 1. single strand (as opposed to double) 2. uracil / U (instead of thymine/T) 3. ribose (sugar as opposed to deoxyribose) 4. RNA is shorter (DNA is longer) 5. DNA stays in the nucleus (RNA leaves the nucleus); 	RNA has no T/thymine		(1)

Question Number	Answer	Accept	Reject	Mark
7(b)	<p>Any four from:</p> <ol style="list-style-type: none"> 1. for translation; 2. for protein synthesis ; 3. (mRNA joins to) ribosomes ; 4. codons/three bases /triplet; 5. match up to anticodons /match up to complimentary base pairs/OWTTE ; 6. tRNA (joins to mRNA) ; 7. which carry (specific) amino acids ; 8. which are joined together ; 9. by enzymes ; 	<p>makes proteins /polypeptides</p>		<p>(4)</p>

TOTAL MARKS 30